

WHAT IS CLAIMED IS:

1. An arithmetic performance attribution method for determining portfolio performance, relative to a benchmark, over multiple time periods t , where t varies from 1 to T , comprising the steps of:

5 determining coefficients $(A + \alpha_t)$, where the values α_t are defined as

$$\alpha_t = \left[\frac{R - \bar{R} - A \sum_{k=1}^T (R_k - \bar{R}_k)}{\sum_{k=1}^T (R_k - \bar{R}_k)^2} \right] (R_t - \bar{R}_t),$$

where R_t is a portfolio return for period t , \bar{R}_t is a benchmark return for period t , R is determined by

$$R = \left[\prod_{t=1}^T (1 + R_t) \right] - 1,$$

10 and \bar{R} is determined by

$$\bar{R} = \left[\prod_{t=1}^T (1 + \bar{R}_t) \right] - 1;$$

and determining the portfolio performance as

$$R - \bar{R} = \sum_{t=1}^T \sum_{i=1}^N (A + \alpha_t) (I_{it}^A + S_{it}^A),$$

15 where I_{it}^A is an issue selection for sector i and period t , and S_{it}^A is a sector selection for sector i and period t .

2. The method of claim 1, wherein A is

$$A = \frac{1}{T} \left[\frac{(R - \bar{R})}{(1 + R)^{1/T} - (1 + \bar{R})^{1/T}} \right], \text{ where } R \neq \bar{R},$$

or for the special case $R = \bar{R}$:

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$$A = (1 + R)^{(T-1)/T}.$$

3. The method of claim 1, wherein $A = 1$.

Sub B1 > 4. A geometric performance attribution method for determining portfolio
25 performance, relative to a benchmark, over multiple time periods t , where t varies from 1 to T , comprising the steps of:

determining attribution effects for issue selection $(1 + I_{it}^{G,Vestek})$ given by

$$1 + I_{it}^{G,Vestek} = \left(\frac{1 + w_{it} r_{it}}{1 + w_{it} \bar{r}_{it}} \right) \Gamma_t$$

and determining attribution effects for sector selection $(1 + S_{it}^{G,Vestek})$ given by

$$1 + S_{it}^{G,Vestek} = \left(\frac{1 + w_{it} \bar{r}_{it}}{1 + \bar{w}_{it} \bar{r}_{it}} \right) \left(\frac{1 + \bar{w}_{it} \bar{R}_t}{1 + w_{it} \bar{R}_t} \right) \Gamma_t,$$

5 where the values of Γ_t are

$$\Gamma_t = \left[\left(\frac{1 + R_t}{1 + \bar{R}_t} \right) \prod_{j=1}^N \frac{(1 + \bar{w}_{jt} \bar{r}_{jt})(1 + w_{jt} \bar{R}_t)}{(1 + w_{jt} r_{jt})(1 + \bar{w}_{jt} \bar{R}_t)} \right]^{\frac{1}{2N}},$$

where r_{jt} is a portfolio return for sector j for period t , \bar{r}_{jt} is a benchmark return for sector j for period t , w_{jt} is a weight for r_{jt} , \bar{w}_{jt} is a weight for \bar{r}_{jt} , R is determined by


$$R = \left[\prod_{t=1}^T (1 + R_t) \right] - 1$$

10 and \bar{R} is determined by

$$\bar{R} = \left[\prod_{t=1}^T (1 + \bar{R}_t) \right] - 1;$$

and determining the portfolio performance as

$$\frac{1 + R}{1 + \bar{R}} = \prod_{t=1}^T \prod_{i=1}^N (1 + I_{it}^{G,Vestek})(1 + S_{it}^{G,Vestek}).$$

15  5. A computer system, comprising:

a processor programmed to perform an arithmetic performance attribution computation to determine portfolio performance, relative to a benchmark, over multiple time periods t , where t varies from 1 to T , by determining coefficients $(A + \alpha_t)$, where the values α_t are defined as

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$$\alpha_t = \left[\frac{R - \bar{R} - A \sum_{k=1}^T (R_k - \bar{R}_k)}{\sum_{k=1}^T (R_k - \bar{R}_k)^2} \right] (R_t - \bar{R}_t),$$

where R_t is a portfolio return for period t , \bar{R}_t is a benchmark return for period t , R is determined by

$$R = \left[\prod_{t=1}^T (1 + R_t) \right] - 1,$$

and \bar{R} is determined by

$$\bar{R} = \left[\prod_{t=1}^T (1 + \bar{R}_t) \right] - 1;$$

and determining the portfolio relative performance as

$$5 \quad R - \bar{R} = \sum_{t=1}^T \sum_{i=1}^N (A + \alpha_i)(I_{it}^A + S_{it}^A),$$

where I_{it}^A is an issue selection for sector i and period t , and S_{it}^A is a sector selection for sector i and period t ; and

a display device coupled to the processor for displaying a result of the arithmetic performance attribution computation.

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6. A computer system, comprising:

a processor programmed to perform a geometric performance attribution computation to determine portfolio performance, relative to a benchmark, over multiple time periods t , where t varies from 1 to T , by determining attribution effects for issue selection $(1 + I_{it}^{G,Vestek})$ given by

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$$1 + I_{it}^{G,Vestek} = \left(\frac{1 + w_{it} r_{it}}{1 + w_{it} \bar{r}_{it}} \right) \Gamma_t$$

and determining attribution effects for sector selection $(1 + S_{it}^{G,Vestek})$ given by

$$1 + S_{it}^{G,Vestek} = \left(\frac{1 + w_{it} \bar{r}_{it}}{1 + \bar{w}_{it} \bar{r}_{it}} \right) \left(\frac{1 + \bar{w}_{it} \bar{R}_t}{1 + w_{it} \bar{R}_t} \right) \Gamma_t,$$

where the values of Γ_t are,

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$$\Gamma_t = \left[\left(\frac{1 + R_t}{1 + \bar{R}_t} \right) \prod_{j=1}^N \frac{(1 + \bar{w}_{jt} \bar{r}_{jt})(1 + w_{jt} \bar{R}_t)}{(1 + w_{jt} r_{jt})(1 + \bar{w}_{jt} \bar{R}_t)} \right]^{\frac{1}{2N}},$$

where r_{jt} is a portfolio return for sector j for period t , \bar{r}_{jt} is a benchmark return for sector j for period t , w_{jt} is a weight for r_{jt} , \bar{w}_{jt} is a weight for \bar{r}_{jt} , R is determined by

$$R = \left[\prod_{t=1}^T (1 + R_t) \right] - 1$$

and \bar{R} is determined by

$$\bar{R} = [\prod_{t=1}^T (1 + \bar{R}_t)] - 1;$$

and determining the portfolio performance as

$$\frac{1 + R}{1 + \bar{R}} = \prod_{t=1}^T \prod_{i=1}^N (1 + I_{it}^{G, Vestek})(1 + S_{it}^{G, Vestek});$$

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and

a display device coupled to the processor for displaying a result of the geometric performance attribution computation.

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7. A computer readable medium which stores code for programming a processor to perform an arithmetic performance attribution computation to determine portfolio performance, relative to a benchmark, over multiple time periods t , where t varies from 1 to T , by determining coefficients $(A + \alpha_t)$, where the values α_t are defined as

$$\alpha_t = \left[\frac{R - \bar{R} - A \sum_{k=1}^T (R_k - \bar{R}_k)}{\sum_{k=1}^T (R_k - \bar{R}_k)^2} \right] (R_t - \bar{R}_t),$$

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where R_t is a portfolio return for period t , \bar{R}_t is a benchmark return for period t , R is determined by

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$$\bar{R} = [\prod_{t=1}^T (1 + \bar{R}_t)] - 1;$$

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and determining the portfolio relative performance as

$$R - \bar{R} = \sum_{t=1}^T \sum_{i=1}^N (A + \alpha_t)(I_{it}^A + S_{it}^A),$$

where I_{it}^A is an issue selection for sector i and period t , and S_{it}^A is a sector selection for sector i and period t .

5 8 A computer readable medium which stores code for programming a processor to perform a geometric performance attribution computation to determine portfolio performance, relative to a benchmark, over multiple time periods t , where t varies from 1 to T , by determining attribution effects for issue selection $(1 + I_{it}^{G,Vestek})$ given by

$$1 + I_{it}^{G,Vestek} = \left(\frac{1 + w_{it} r_{it}}{1 + w_{it} \bar{r}_{it}} \right) \Gamma_t$$

and determining attribution effects for sector selection $(1 + S_{it}^{G,Vestek})$ given by

$$1 + S_{it}^{G,Vestek} = \left(\frac{1 + w_{it} \bar{r}_{it}}{1 + \bar{w}_{it} \bar{r}_{it}} \right) \left(\frac{1 + \bar{w}_{it} \bar{R}_t}{1 + w_{it} \bar{R}_t} \right) \Gamma_t,$$

where the values of Γ_t are,

$$\Gamma_t = \left[\left(\frac{1 + R_t}{1 + \bar{R}_t} \right) \prod_{j=1}^N \frac{(1 + \bar{w}_{jt} \bar{r}_{jt})(1 + w_{jt} \bar{R}_t)}{(1 + w_{jt} r_{jt})(1 + \bar{w}_{jt} \bar{R}_t)} \right]^{\frac{1}{2N}},$$

10 where r_{jt} is a portfolio return for sector j for period t , \bar{r}_{jt} is a benchmark return for sector j for period t , w_{jt} is a weight for r_{jt} , \bar{w}_{jt} is a weight for \bar{r}_{jt} , R is determined by

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and \bar{R} is determined by

$$\bar{R} = \left[\prod_{t=1}^T (1 + \bar{R}_t) \right] - 1;$$

15 and determining the portfolio performance as

$$\frac{1 + R}{1 + \bar{R}} = \prod_{t=1}^T \prod_{i=1}^N (1 + I_{it}^{G,Vestek})(1 + S_{it}^{G,Vestek}).$$

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